



A Charutar Vidya Mandal's Institution
V.P. & R.P.T.P. SCIENCE COLLEGE
(AUTONOMOUS) (Grant-in-Aid)
Affiliated to Sardar Patel University
VALLABH VIDYANAGAR-388120



Bachelor of Science (Semester 4) Internal Examination - 2026
US04MIPHY01: Physics of Solids

Date: 10/03/26, Tuesday

Time: 02:45 PM to 03:45 PM

Total marks :20

Q-1 Multiple Choice Questions

[06]

- (1) The fundamental mathematical condition in $U(r) = -\frac{a}{r^m} + \frac{b}{r^n}$ is
(a) $n > m$ (b) $n < m$ (c) $n \geq m$ (d) $n \leq m$
- (2) The Madelung constant for NaCl structure is _____.
(a) 0.75 (b) 1.00 (c) 1.64 (d) 1.75
- (3) _____ has a metallic bond.
(a) Na (b) Ge (c) Si (d) He
- (4) The condition $a = b = c$; $\alpha = \beta = \gamma = 90^\circ$ is true for _____ structure.
(a) Cubic (b) Tetragonal (c) Orthorhombic (d) Monoclinic
- (5) _____ cubic is not a cubic structure.
(a) Simple (b) Body centered (c) Face centered (d) Base centered
- (6) The number of atoms present in unit cell of BCC structure is _____.
(a) 1 (b) 2 (c) 4 (d) 6

Long Questions:

Q-2 Derive the Madelung constant for NaCl in one dimension and three dimensions. [07]

OR

Q-2 Discuss properties of covalent bond in detail. Give any two examples of covalent bond. [07]

Q-3 On the basis of lattice parameters discuss all crystal systems in detail. [07]

OR

Q-3 Discuss the method to determine Miller indices of a plane with proper example. Also draw planes having miller indices: (100), (110) and (111) for a cubic crystal. [07]



No of printed pages: 01

Supervisor sign

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BSc (Semester 4) Quiz - 2026

US04MIPHY01

Physics of Solids

Date: 10/03/26, Tuesday

Time: Maximum 10 minutes

Total marks :05

Whether the following statement is true or false. Write your answer in the box. [05]

- | | | |
|---|---|---|
| (i) Germanium has a metallic bond. | [|] |
| (ii) Van der Waal's bond is a secondary bond. | [|] |
| (iii) Ionic crystals in a solid form are good conductors. | [|] |
| (iv) Atomic packing factor of BCC is 74% | [|] |
| (v) There are 23 elements of symmetry in a cubic crystal. | [|] |

